

***Amendments to the Claims***

The listing of claims will replace all prior versions, and listings of claims in the application.

1. (previously presented) A receiver for demodulating a multi-tone, multi-band signal modulated using an inverse discrete Fourier transform to generate a signal having a plurality of tones spaced in frequency in a plurality of frequency bands, comprising:

a plurality of demodulators, wherein:

each of the plurality of demodulators is configured to demodulate a data signal having a different one of the plurality of frequency bands of the multi-tone, multi-band signal, and is configured to utilize a different sampling rate,

each demodulator includes a discrete Fourier transform module and at least two of the plurality of demodulators have different discrete Fourier transform sizes,

each demodulator includes a time equalizer coupled to the input of the discrete Fourier transform module,

at least one of the plurality of demodulators receives a downsampled data signal, and

the plurality of demodulators are configured to perform demodulation in parallel.

2. (previously presented) The receiver of claim 1 wherein the sampling rate of each demodulator is determined by the respective frequency band.

3. (original) The receiver of claim 1 wherein each demodulator further includes an equaliser connected to the output of the discrete Fourier transform.

4. (cancelled)

5. (original) A transceiver including a receiver according to claim 1.

6. (original) The transceiver of claim 5 in which each demodulator includes an echo canceller for removing an echo associated with a signal in a transmitter of the transceiver from the received signal.

7. (original) The transceiver of claim 6 in which the echo canceller is connected to remove the echo at the input to the discrete Fourier transform.

8. (original) The transceiver of claim 6 in which each echo canceller comprises an adaptive filter.

9. (original) The receiver of claim 1 in which the multi-band signal is generated by nulling selected tones in the modulator.

10. (original) The receiver of claim 1 in which the multi-band signal is generated by filtering the output of the modulator.

11. (previously presented) A method of demodulating a multi-tone, multi-band signal modulated using an inverse discrete Fourier transform, comprising the steps of:

dividing the multi-tone, multi-band signal into a plurality of data signals, each data signal having a plurality of tones in one of the plurality of frequency bands; and

equalizing each of the plurality of data signals in the time domain; and

demodulating, in parallel each of the plurality of equalized data signals in a separate demodulator using a discrete Fourier transform, wherein each demodulator

utilizes a different sampling rate and wherein at least two demodulators use different size discrete Fourier transforms.

12. (previously presented) The method of claim 11 wherein each demodulator further comprises an frequency equalisation step after the demodulation step.

13. (original) The method of claim 11 wherein each demodulator filters the received signal prior to the discrete Fourier transform.

14. (original) The method of claim 11 in which the demodulating step is carried out in a transceiver.

15. (original) The method of claim 14 in which each demodulator further performs an echo cancellation step to remove an echo associated with the signal in a transmitter of the transceiver from the received signal.

16. (previously presented) The method of claim 11 wherein the multi-band signal is generated by nulling selected tones in the modulator.

17. (original) The method of claim 11 in which the multi-band signal is generated by filtering the output of the modulator.

18. (previously presented) The receiver of claim 1 further comprising a splitter that divides the received multi-tone, multi-band signal into a plurality of data signals, each data signal having a plurality of tones in one of the plurality of frequency bands,

wherein the splitter communicates each of the plurality of data signals to one of the plurality of demodulators that demodulates the frequency band of the data signal.

19. (previously presented) The receiver of claim 1 wherein the discrete Fourier transform module performs a discrete Fourier transform at sampling frequency ( $F_s$ ,  $k$ ) wherein the sampling frequency ( $F_s$ ,  $k$ ) is associated with the frequency band of the demodulator.

20. (previously presented) The receiver of claim 19 wherein the sampling frequency ( $F_s$ ,  $k$ ) is at least double the maximum frequency of the frequency band of the demodulator.

21. (new) A receiver for demodulating a multi-tone, multi-band signal modulated using an inverse discrete Fourier transform to generate a signal having a plurality of tones spaced in frequency in a plurality of frequency bands, comprising:

a plurality of demodulators, wherein:

each of the plurality of demodulators is configured to demodulate a data signal having a different one of the plurality of frequency bands of the multi-tone, multi-band signal, and is configured to utilize a different sampling rate,

each demodulator includes a discrete Fourier transform module and at least two of the plurality of demodulators have different discrete Fourier transform sizes,

each demodulator includes a time equalizer coupled to the input of the discrete Fourier transform module,

at least one of the plurality of demodulators receives a downsampled data signal, and

the plurality of demodulators are configured to perform demodulation in parallel; and

a splitter that divides the received multi-tone, multi-band signal into a plurality of data signals, each data signal having a plurality of tones in one of the plurality of frequency bands,

wherein the splitter communicates each of the plurality of data signals to one of the plurality of demodulators that demodulates the frequency band of the data signal; and

wherein the splitter further includes a plurality of filters, each filter coupled to one of the plurality of demodulators.